

Tracing Monastic Economic Interests and Their Impact on the Rural Landscape of Late Byzantine Lemnos

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During the late Byzantine period, Byzantine society experienced a variety of changes and challenges. The economic and demographic growth of the thirteenth century turned into a crisis in the fourteenth century due to overpopulation, exhaustion of resources, and the Black Death. Significant changes in the Mediterranean trade system and in the political and economic situation of the Byzantine empire also added to the crisis. These new economic and demographic conditions and their impact on the rural society have been sufficiently dealt with elsewhere.¹ The present

study contributes to the larger subject of Byzantine monasteries, their economic activities, their impact on a changing landscape, and their adaptability to the economic and demographic stress of the late Byzantine period. Although much research has been done on monastic fortunes and economic activities, especially those of the monasteries of Mount Athos, less attention has been paid to the monasteries as agents of change in the rural landscape.² This article explores how monasteries altered both the natural and built environment in pursuit of their own interests. It further examines the spatial distribution of their monastic estates to

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2. D. Jacoby, "Phénomènes de démographie rurale à Byzance aux XIII^e, XIV^e et XV^e siècles," *Études rurales* 5–6 (1962): 161–86; A. E. Laiou-Thomadaki, *Peasant Society in the Late Byzantine Empire: A Social and Demographic Study* (Princeton, 1977); eadem, "The Agrarian Economy, Thirteenth–Fifteenth Centuries," *EHB* 1:311–75; J. Lefort, "Population and Landscape in Eastern Macedonia during the Middle Ages: The Example of Radolibos," in *Continuity and Change in Late Byzantine and Early Ottoman Society*, ed. A. Bryer and H. Lowry (Birmingham, 1986), 11–21; eadem, "Population et peuplement en Macédoine Orientale, IX^e–XV^e siècle," in *Hommes*

et richesses dans l'Empire byzantin, vol. 2, *VIII^e–XV^e siècle*, ed. V. Kravari, idem, and C. Morisson, *Réalités byzantines* 3 (Paris, 1991), 63–82.

2. M. Živojinović, "The Trade of Mount Athos Monasteries," *ZRVI* 29–30 (1991): 101–16; J. Koder, "Mönchtum und Kloster als Faktoren der byzantinischen Siedlungs-Geographie," in "Byzantium and the North," special issue, *Acta Byzantina Fennica* 7 (1995): 7–44; A. Laiou, "Economic Activities of Vatopedi in the Fourteenth Century," in *The Monastery of Vatopedi: History and Art*, ed. P. Gounaris (Athens, 1999), 55–72; M. Nystazopoulou-Pelekidou, "Les couvents de l'espace égéen et leur activité maritime (Xe–XIII^e s.)," *Summeikta* 15 (2000): 109–30; S. Popović, "Shaping a Monastery Settlement in the Late Byzantine Balkans," in *Shaping Community: The Art and the Archaeology of Monasticism*, ed. S. McNally, BAR International Series 941 (Oxford, 2001), 129–46; K. Smyrlis, "The Management of Monastic Estates: The Evidence of the *Typika*," *DOP* 56 (2002): 245–57; idem, *La fortune des grands monastères byzantins (fin du Xe–milieu du XIV^e siècle)* (Paris, 2006).

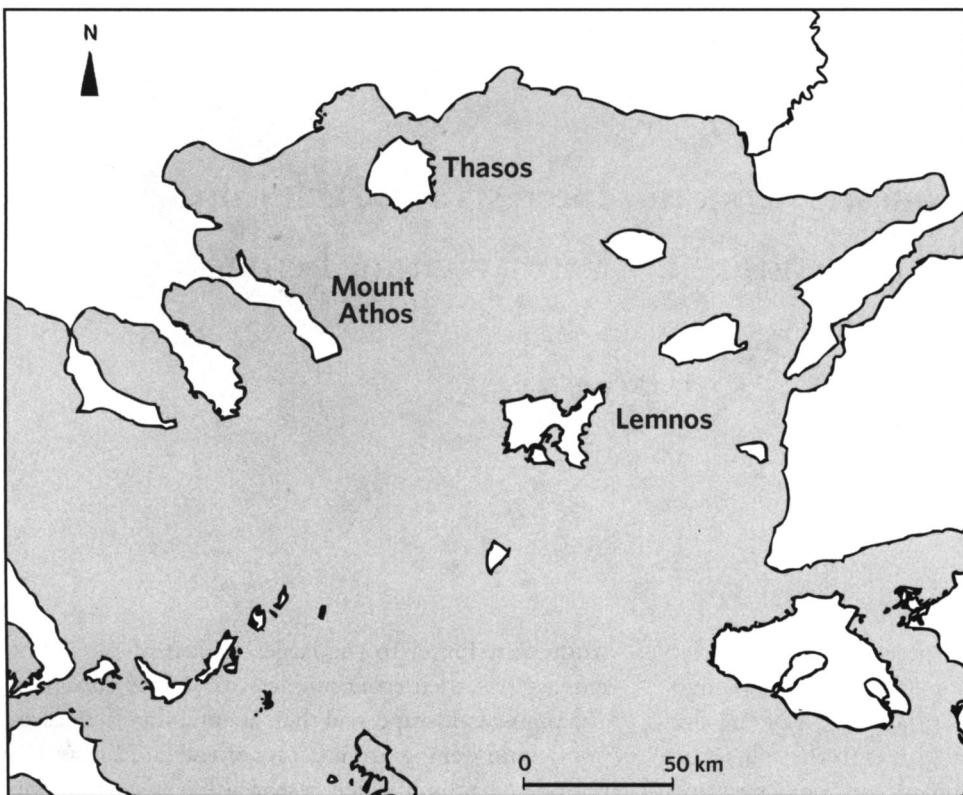


FIG. 1. Aegean Sea
(all maps, photos, and
drawings in this article
by F. Kondyli)

facilitate their economic activities and the relationship of the estates with other sites.

To explore such issues I have focused on late Byzantine Lemnos. Lemnos is an ideal case study because it remained under Byzantine control until the fall of the empire, because it had valuable resources, and because it was strategically located in proximity to important trade routes that connected the capital and the Northern Aegean to the rest of the world. In a period when the empire had permanently lost other regions and their valuable resources, the fertile soils and the diverse landscape of Lemnos enhanced the island's economic importance. These qualities plus the island's proximity to Mount Athos made Lemnos suitable for establishing monastic estates and for undertaking various economic activities (fig. 1).

Methodology and Limitations

To investigate monastic economic activities and their impact on the rural landscape, I have combined the study of the monastic archives (for late Byzantine Lemnos), the Ottoman defters (tax registers for early

Ottoman Lemnos), the archaeological record, ethnographic research, a number of old and modern maps, travelers' accounts, and spatial analysis using GIS (geographic information systems).³ GIS integrates

3. A. H. Moschides, *Η Λήμνος ήτοι ιστορικὸν δοκίμιον τῆς νῆσου ταύτης: Από των αρχαιοτάτων χρόνων μέχρι του 1770* (Alexandria, 1907); T. D. Kapsidelis, *Η Λήμνος επί Φραγκοχρατίας—Τουρκοχρατίας* (Athens, 1971); T. D. Kapsidelis and S. K. Komnenos, *Η Λήμνος από τα πανάρχαια χρόνια ως σήμερα* (Athens, 1982); J. Haldon, "Lemnos, Monastic Holdings and the Byzantine State: Ca.1261–1453," in Bryer and Lowry, *Continuity and Change* (n. 1 above), 161–215, maps a, b; Th. G. Belitsos, *Η Λήμνος και τα χωριά της: Ιστορικές πληροφορίες* (Athens, 1997); idem, *Τα Καμίνια της Λήμνου, Ιστορία-Τοπογραφία-Έθιμα-Οικογένειες* (Athens, 2003); J. Koder, *Aigaion Pelagos: Die Nördliche Ägäis*, vol. 10 of *TIB* (Vienna, 1998); K. Kontellis, *Τα κάστρα της Λήμνου* (Athens, 2004); P. L. Frangellis, *Λήμνος η φιλτάτη*, vol. 3, *Βυζάντιο-Φραγκοχρατία* (Athens, 2000). For Ottoman Lemnos see H. W. Lowry, "A Corpus of Extant Kanunnames for the Island of Limnos as Contained in the Tapu-Tahrir Collection of the Baṣbakanlık Archive," *Journal of Ottoman Studies* 1 (1980): 41–60; idem, *Fifteenth Century Ottoman Realities: Christian Peasant Life on the Aegean Island of Lemnos* (Istanbul, 2002); idem, *The Nature of the Early Ottoman State* (Albany, 2003), 95–114. Some of the maps and travelers' accounts used for this research include V. Sphyroeras, A. Avramea, and S.

hardware, software, and data for capturing, storing, managing, analyzing, and displaying all forms of geographically referenced information.⁴ GIS is not simply a mapmaking tool; its significance lies in its ability to analyze and synthesize different types of data to create new information. Thus, GIS is used in archaeology for identifying spatial patterns, for predicting archaeological site locations, for detecting diachronic changes, and for simulating behavioral activities in the past.⁵ In this case, GIS has allowed a better understanding of the location and distribution of monastic estates and their properties. Through GIS I was able to explore the possible relations of the monastic estates with their surrounding landscape and other sites. Finally, I was able to highlight aspects of agency and decision making. In this article I explore the monasteries' decisions and reasons for where to locate their monastic estates, for where to acquire lands, and for how to manage their properties. As I discuss in later parts of this paper, GIS applications allowed me to trace and interpret such decisions as well as to evaluate their effectiveness. That analysis enabled me to understand how the motives of different agents, i.e., the monasteries, the peasants, and the state, could clash or coincide and thus affect the economic and social life of a region.

The majority of archaeological data used here comes from four seasons of field surveys I conducted on the islands of Lemnos and Thasos as part of my PhD

Asdrahas, eds., *Maps and Map-makers of the Aegean* (Athens, 1985); B. Tourptsoglou-Stefanidou, *Ταξιδιωτικά και γεωγραφικά κείμενα για τη νήσο Λήμνο (15–2005 α.π.)* (Thessalonike, 1986); G. Tolias, *The Greek Portolan Charts, 15th–17th Centuries: A Contribution to the Mediterranean Cartography of the Modern Period* (Athens, 1999); A. Conze, *Reise auf der Insel des Thrakischen Meeres* (Hannover, 1860), pl. 1; L. de Launay, "Notes sur Lemnos," *RA* 27 (1895): 307; C. Fredrich, "Lemnos," *AM* (1906): Tafel XIX; Naval Intelligence Division [of Great Britain], *Geographical Handbook Series: Greece*. B. R. 516, vol. 3 (London, 1944); M. D. Higgins and R. Higgins, *A Geological Companion to Greece and the Aegean* (London, 1996), fig. 12.7; topographic map at 1:50000 by the Hellenic Military Geographical Service; geological map at 1:50000 by the Greek Institute of Geology and Mineral Exploration.

4 P. A. Burrough, *Principles of Geographic Information Systems for Land Resource Assessment*, Monographs on Soil and Resources Survey 12 (New York, 1986), 6; J. Star and J. Estes, *Geographic Information Systems: An Introduction* (Upper Saddle River, 1990), 2; J. Conolly and M. Lake, *Geographical Information Systems in Archaeology* (Cambridge, 2006), 2, 11–12, table 1.1, fig. 2.1.

5 See discussion in Conolly and Lake, *Geographical Information Systems*, 47–50.

thesis, which will soon appear in a monograph.⁶ One of the primary aims of my fieldwork on Lemnos was to identify areas of late Byzantine activity on the island, and study their size, function, and date of use (fig. 2).⁷ The recorded sites include settlements, fortifications, and monastic estates, both *metochia* and their smaller version, the *monydria* (fig. 3).⁸ The surviving archaeological material, mainly late Byzantine pottery, marble reliefs, and, in certain areas, architectural remains, attests to the use of the sites in the late Byzantine period. The presence and identification of archaeological material can be affected by various factors which were taken into consideration and noted for all potential sites, i.e., the degree of visibility on the ground, vegetation cover, agricultural activities such as plowing, and artifact class and size.⁹ Such factors proved to be less problematic for identifying monastic sites on Lemnos (especially where architectural remains are present), and more challenging for estimating the sites' sizes through the distribution of artifacts.¹⁰ During the last seasons of fieldwork, I resurveyed select sites that I had already surveyed the previous seasons and studied changes in artifact distribution. In the resurveyed monastic estates I did not notice dramatic changes in the surface distribution, although it was evident that

6 F. Kondyli, "Late Byzantine Rural Sites in the Northern Aegean: Their Archaeology and Distribution Patterns" (PhD diss., University of Birmingham, 2008).

7 Size and artifact density (see table, below) was estimated by calculating areas of artifact scatter. Size was estimated by locating the center of the scatter and tracking the spread of artifacts in all directions until no artifacts could be seen on the ground. Artifact density was estimated by counting artifact numbers in a 1 × 1 m square around the center of the scatter.

8 A *monydriion* usually housed fewer monks than did a *metochion*, and included only the basic buildings, such as cells, a *katholikon*, a refectory, an ossuary, and storage. From the examples on Lemnos, it seems that *monydria* had fewer functions, especially administrative and perhaps economic, than did the *metochia*.

9 A. J. Ammerman, "Plow-Zone Experiments in Calabria, Italy," *JFA* 12, no. 1 (1985): 33–40; M. J. Schott, "Reliability of Archaeological Records on Cultivated Surfaces: A Michigan Case Study," *JFA* 22, no. 4 (1995): 477–80; R. C. Dunnell and J. F. Simec, "Artifact Size and Plowzone Processes," *JFA* 22, no. 3 (1995): 306; N. Terrenato, "The Visibility of Sites and the Interpretation of Field Survey Results: Towards an Analysis of Incomplete Distributions," in *Extracting Meaning from Ploughsoil Assemblages*, ed. R. Francovich, H. Patterson, and G. Barker (Oxford, 2000), 60–71.

10 Dunnell and Simec, "Artifact Size," 306.

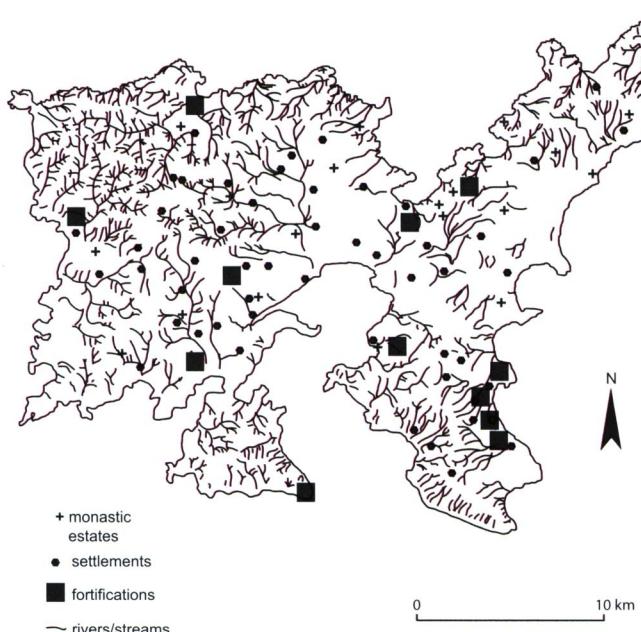


FIG. 2. Distribution of recorded late Byzantine sites on Lemnos

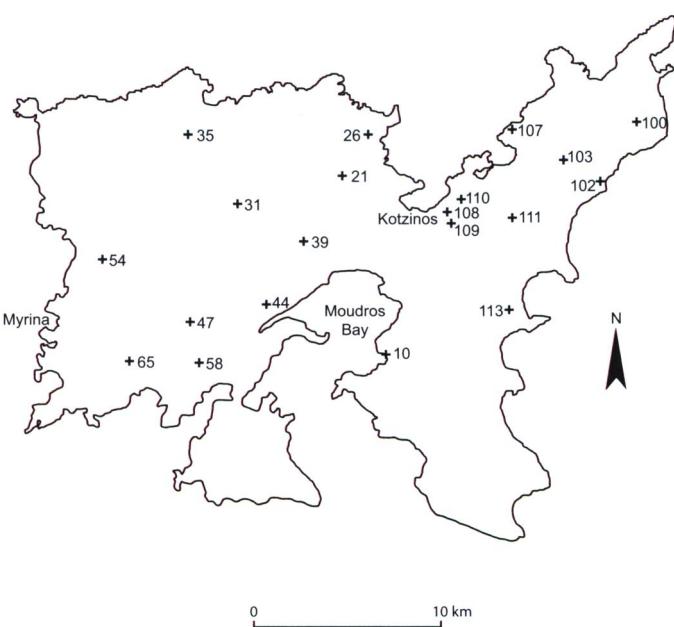


FIG. 3. Distribution of recorded late Byzantine monastic estates

the sites were experiencing different types and levels of cultivation practices.¹¹ Thus the estimate of monastic estates' sizes during the fourth season was overall close to my original estimate, which was not the case for other types of sites, such as small settlements.

The combined study of archives, pottery densities, and architectural remains was in many cases useful to assign function to sites, or at least distinguish between monastic and non-monastic ones. However, in areas where settlements were in close proximity to monastic estates this distinction was often not possible. In the area of Kontovraki, for example, there were monastic properties for the monastery of Iviron, a metochion of Lavra monastery, and a nearby settlement, so it was impossible to estimate where the monastic estates finished and the settlement began.¹²

11 Areas in and around a metochion often produced more pottery, in far better condition than the very fragmented and worn sherds at other sites; in my opinion this is partly the result of less-intense exploitation around a metochion, where auxiliary spaces, gardens, and courtyards were located, rather than fields.

12 P. Lemerle, A. Guillou, N. Svoronos, and D. Papachryssanthou, eds., *Actes de Lavra*, 4 vols. (Paris, 1970–82), 2: no. 73 (1284), 16–22; 2: no. 74 (1284), 22–27; 3: no. 139 (1361), 74–82; J. Lefort, D. Papachryssanthou, V. Kravari, and H. Metreveli, eds., *Actes de*

The identification of metochia or monyndria was further facilitated by their continued use in the post-Byzantine period, and by the presence of post-Byzantine structures. For example, in the metochia at Kontias, Gomatou, Ano Chorion, and Moudros, the modern church or monastic complex was built on top of an earlier structure, or parts of the Byzantine monastery were incorporated in the modern structure (nos. 58, 35, 44, and 10 in fig. 3).¹³

Dating the use of structures and areas of activity was also in some cases problematic. In specific monastic acts where the building, continuous functioning, or restoring of a monastic estate or church is mentioned, we have an indication of dates and continuity of use. However, the main tool for estimating periods of use has been late Byzantine pottery, especially glazed

Iviron, 4 vols. (Paris, 1985–), 4: no. 99 (1430–48), 165–69. For a discussion on the difficulties of assigning function to a site and of distinguishing between monastic sites and settlements, see R. Ousterhout, *A Byzantine Settlement in Cappadocia* (Washington, DC, 2005), 176–81.

13 Kapsidelis and Komnenos, *Λήμνος* (n. 3 above), 185; Koder, *Aigaion Pelagos*, 127, 199, 236, 269; N. Sifounakis et al., *Ναοί και εξωχελήσια της Λήμνου: Η ιστορία, η αρχιτεκτονική και η διαχέσματά τους 1805–αρχές 2000ύ αιώνα* (Athens, 1999).



FIG. 4.
Zeuxippus subtypes
from the excavations
at Kotzinos, Lemnos

decorated sherds, although marble reliefs and architectural remains, when available, have also been used. The limitations of pottery, especially pottery from a field survey, as a dating tool are well known.¹⁴ The glazed pottery that dates from the thirteenth to the fifteenth centuries is often not sufficient to successfully discuss period-specific issues such as the abandonment or continuity of habitation and use of sites in the second half of the fourteenth century (fig. 4). In the case of Lemnos, however, two factors make the pottery useful for dating. First, Lemnos produced its own glazed decorated pottery locally and, although different dates have been proposed, the end of the fourteenth century and definitely the beginning of the fifteenth century are most probable for the start of this production (fig. 5).¹⁵ Locally made pottery was found in some sites alongside

pottery dating from the thirteenth and fourteenth centuries, an indication either of continuous use of that site or of possible abandonment in the second half of the fourteenth century and reoccupation in the fifteenth. Second, the pottery recorded in the field was compared to the stratified—and therefore more securely dated—Byzantine pottery found in the excavations of the castle of Kotzinos to better establish typologies and chronological sequence of the pottery found during my field survey.

Monastic Presence on Late Byzantine Lemnos

Monastic estates were present on the island from at least the twelfth century but their numbers and fortunes increased significantly in the course of the last two Byzantine centuries, as more Athonite monasteries acquired land and other possessions on the island.¹⁶ The monastic presence on the island continued into the Ottoman period, and some Athonite monasteries maintained their original properties and continued to cultivate the lands they acquired in the late Byzantine

14 T. E. Gregory, "The Byzantine Problem," in *The Sydney Cyprus Survey Project: Social Approaches to Regional Archaeological Survey*, ed. M. Given and A. B. Knapp, *Monumenta Archaeologica* 21 (Los Angeles, 2003), 283–94; idem, "Less Is Better: The Quality of Ceramic Evidence from Archaeological Survey and Practical Proposals for Low-Impact Survey in a Mediterranean Context," in *Mediterranean Archaeological Landscapes: Current Issues*, ed. E. Athanassopoulos and L. Wandsnider (Philadelphia, 2004), 32–69.

15 Ch. Pennas, "Το μεσαιωνικό Φρούριο Κότζινος της Λήμνου," *Αρχαιολογία* 50 (1994): 68–74; V. François, *La céramique Byzantine à Thasos* (Paris, 1995), 98–100; E. Dori et al., *Κάτω Κάστρο: Η πρώτη φάση των ανασκαφών στο Βενετικό φρούριο της χώρας Ανδρον* (Andros, 2003), 124–27, 134–35.

16 *Lavra* (n. 12 above) 2: no. 73 (1284), 16–22; M. Nystazopoulou-Pelekidou, ed., *Βυζαντινά έγγραφα της Μονής Πάτμου*, vol. 2, *Δημοσιών Λειτουργών* (Athens, 1980), no. 74 (1285), 220–23; P. Lemerle, "Un chrysobulle d'Andronic II Paléologue pour le monastère de Karakala," *BCH* 60 (1936): 428–46; Haldon, "Limnos" (n. 3 above) 165–175.



FIG. 5.
Late byzantine sgraffito
ware (locally made) from
the excavations at
Kotzinos, Lemnos

period.¹⁷ In the Byzantine period the monastic properties were not very extensive, covering only one-twelfth of the island, as Haldon has successfully shown.¹⁸ The extent of monastic property and the quality of their lands varied significantly between poorer monasteries, which owned small estates and very few *modioi* of average-quality land, and richer ones, which owned buildings, towers, harbors, churches, and lands of various qualities. The establishment of monastic estates on Lemnos formed part of the economic strategies of the Athonite monasteries and was closely associated with income-generating activities. However, in pursuit of their economic interest, the monasteries not only impacted the natural and built environment but, as I argue in this article, significantly affected the society and economy of Lemnos.

Monastic Economic Activities on Lemnos

The monasteries were interested in maintaining self-sufficiency and in increasing their possessions and revenues. Most monastic income on the island came from exploiting natural resources, although renting and selling of properties such as fields, houses, and workshops and receiving donations and tax relief also added to the

monasteries' wealth.¹⁹ Although the core economic interests of the monasteries remained unchanged, new conditions in the fourteenth century—the economic and demographic crisis, the lack of manpower, the political instability in the empire, the rivalry among the Italian cities for control of trade, and numerous pirate attacks that begged for additional safety measures—forced the monasteries to adjust their economic activities and expand their role on the island. These adjustments can be seen in changes in land use, in the efforts of the monasteries to repopulate abandoned areas, and in their active participation in the defense of the island.

Lemnos offers vast lands suitable especially for cultivating cereal crops, vineyards, and fruit trees, all of which were a major incentive for the monasteries' establishing estates and owning lands on the island (fig. 6). In the late Byzantine period monasteries cultivated cereals—mainly wheat, but also barley and fodder—in the fertile plains in the central, northern, and eastern part of the island, evident on the map (fig. 7). In the Ottoman defter of 1490 the same areas were listed among those with the highest cereal productivity. The monastic lands especially of Lavra, Dionysiou, Pantokrator, Vatopedi, and Kutlumus produced in 1490 significantly larger quantities of cereal than any other lands around the island.²⁰

17 H. Lowry, "A Note on the Population and Status of the Athonite Monasteries under Ottoman Rule ca. 1520," *Wiener Zeitschrift für die Kunde des Morgenlandes* 73 (1981): 115–35; idem, "The Fate of Byzantine Monastic Properties under the Ottomans," *ByzF* 16 (1991): 287–88.

18 Haldon, "Lemnos," 175.

19 For an extensive discussion on monastic fortunes see Smyrlis, *Grands monastères byzantins* (n. 2 above).

20 Lowry, *Ottoman Realities* (n. 3 above), 92, 93–98, table 13.



FIG. 6. View of the arable lands in the area of Gomatou, northwestern Lemnos

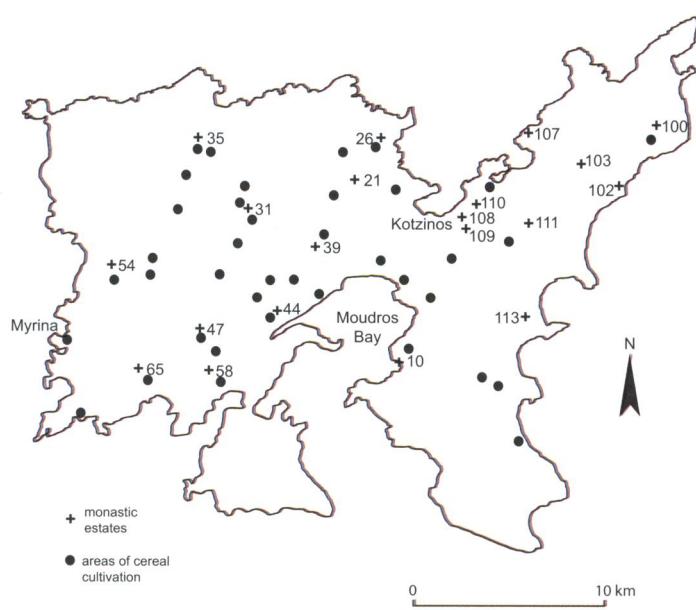


FIG. 7. Distribution map of areas of cereal production on late Byzantine Lemnos

The wine of Lemnos has been well known since ancient times, when it was exported.²¹ In the late Byzantine period wine was produced by the landowners of the island, both monastic estates and peasants. According to the archives, vineyards owned by monasteries were found mostly in the center of the island extending north to Gomatou, Tryge, and Atziki; south toward Kontias and Pteri; and east around Moudros and Skala, as can be seen on the map (fig. 8). These areas are also recorded as areas of extensive wine production in the defters of the early Ottoman period.²² Both the Byzantine archives and Ottoman defters suggest that monasteries such as Lavra and Vatopedi had sufficient vineyards to create a sellable surplus of wine.²³ It is

21 Fredrich, "Lemnos" (n. 3 above), 243; C. Boulotis, "Κουκονήσι: Ένας νέος προϊστορικός οικισμός στον κόλπο του Μούδρου και το προϊστορικό πρόσωπο της Λήμνου," *Αρχαιολογία* 50 (1994): 21.

22 Lowry, *Ottoman Realities*, 102–6, table 14. Viticulture continued in the Ottoman period, when the export of grape syrup became an important and very profitable enterprise; see *ibid.*, 87, 108. Note that most of the areas shown on the map still have active vineyards.

23 *Lavra* 4:134–46; J. Lefort, V. Kravari, C. Giros, and K. Smyrlis,

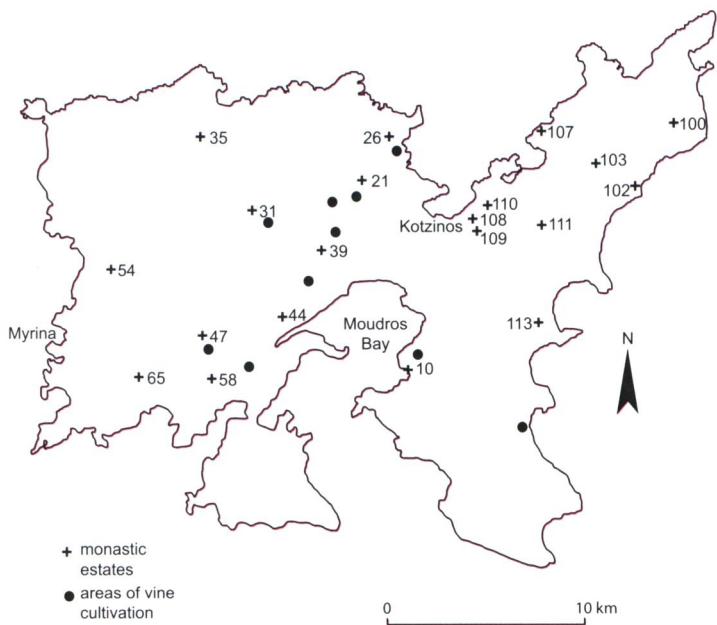


FIG. 8. Distribution map of areas of viticulture on Late Byzantine Lemnos

possible that the monasteries were selling their Lemnian wine to markets as far away as Constantinople, where a variety of wines from different regions was sold and even resold to regions in the north.²⁴

Little is known about olive cultivation on the island in the Byzantine period. The monastic archives do not make any references to olive trees or to olive oil production. Today some olive groves can be found on the island, mostly on the eastern part, but still nowhere near the numerous groves of neighboring islands. The cultivation of sesame in the early modern period to produce cooking oil must have been a response to the lack of olive trees.²⁵

eds., *Actes de Vatopédi*, 2 vols. (Paris, 2001–6), 2:39–42. The monastic lands of Lavra, Vatopedi, and Pantokrator had the highest production in the early Ottoman period: Lowry, *Ottoman Realities*, 102–6.

24 M. Gerolymatou, “Εισαγωγές οίνου στην Κωνσταντινούπολη από τα μέσα του 14ου μέχρι τα μέσα του 15ου αιώνα,” in *Μονεμβάσιος οίνος–Μοναβάσ(ι)α–Malvasia*, ed. E. Anagnostakis (Athens, 2008), 61, 69. The term “vino di Romania bassa” found in Venetian documents refers to wine made in Greek lands, including the wines produced in the Peloponnese and the Aegean islands and imported in Constantinople.

25 Naval Intelligence Division, *Geographical Handbook* (n. 3 above), 389.

The monasteries also engaged in pastoralism, taking advantage of the good pasture of the island.²⁶ Furthermore, the Phakos peninsula, in the south, was used almost exclusively for grazing and for permanent animal keeps.²⁷ At the end of the fourteenth and beginning of the fifteenth century there was also an increased interest in pastoralism by the monasteries, especially in sheep raising. This interest is evident in the grazing areas mentioned in the archives and the numerous animals owned.²⁸ The interest in raising sheep and other animals continued in the Ottoman era; in 1490 the Ottoman defter recorded 24,509 sheep, an average of 34.47 per household, making the taxes paid for them the state's largest source of revenue from the island.²⁹ Investments in pastoralism in the fourteenth and fifteenth centuries should be associated with the lack of sufficient manpower to cultivate the available land, with the smaller effort and expense needed for such an economic activity, and with the variety of its byproducts. For example, Lemnos was exporting large quantities of cheese, mainly to the capital, continuously between at least the fifteenth to seventeenth centuries.³⁰ The state further encouraged animal husbandry in the beginning of the fifteenth century by exempting the Athonite monasteries from the taxes on flocks.³¹ In regions with intense agricultural production, pastoralism functions as an alternative economic activity and as a safety net against years

26 In the archives, recurrent terms such as νομή, λιβαδιαία γῆ, and νομαδιαία γῆ are indicative of pasture. The importance of such activities to the state is expressed by taxes on pasture; the word ἐννόμιον, a tax on pasture, is met frequently in the archives, especially by the end of the 14th c., when the ownership of sheep and cattle increased. *Lavra* (n. 12 above), 3: no. 126 (1346), 32; no. 136 (1355), 61; no. 171 (1447), 193; appendix xviii (1415), 219; G. Dagron, P. Lemerle, and S. Ćirković, ed., *Actes de Saint-Pantéleémône* (Paris, 1982), no. 17 (1407), 124.

27 Naval Intelligence Division, *Geographical Handbook*, 390; V. Kravari, ed., *Actes du Pantokrator* (Paris, 1991), 40–42; N. Oikonomides, ed., *Actes de Dionysiou* (Paris, 1968), no. 25 (1430), 135–38; *Lavra*, 3: no. 141 (1362), 85.

28 *Lavra*, 3: appendix xviii (1415), 219; *Saint-Pantéleémône*, no. 17 (1407), 120–24.

29 Lowry, *Ottoman Realities*, 135–36.

30 B. Randolph, *The Present State of the Islands in the Archipelago (or Arches), Sea of Constantinople and Gulf of Smyrna; With the Islands of Candia and Rhodes* (Oxford, 1687), 42–43; Lowry, *Ottoman Realities*, 109–10.

31 Laiou, “Agrarian Economy” (n. 1 above), 368.

of bad yields that could be caused, among others, by harsher weather conditions. Paleoenvironmental and documentary evidence suggests the climate of the Mediterranean became cooler and wetter in the fifteenth century, with harsher winters that could prove catastrophic for the crops. More investments in pastoralism in fourteenth- and fifteenth-century Lemnos could thus be partly interpreted as an adjustment of economic strategies to the new climatic conditions.³²

The economic interests of the monasteries expanded into other activities mainly for their own consumption but in some cases for trade. These activities included maintaining fruit trees, vegetables, and herb gardens; fishing; and exploiting the scrubland (in the absence of forests) for fuel, building material, and perhaps dye.

Surplus products could be sold in the monastic estates, in local markets on the island, and in markets of big cities, including those of Thessalonike and Constantinople. The sale of products in the monastic estates has already been noted in Macedonia but there is only one reference in the archives to Lemnos, where one Lavriot metochion operated as a wine vendor.³³ The monasteries were facilitated in selling their products in local and intra-regional markets by the fact that they owned their own means of transportation. Pack animals for inland transportation and boats for sea trade were used to move products from production sites to storage and from storage to markets. Monasteries such as Lavra, Patmos, and Vatopedi owned boats of different sizes to transport monks and goods.³⁴ Trade

privileges and tax relief to some of these monasteries by the state further encouraged them to participate in regional trade around the Aegean and Black Seas and helped them cope with Italian competition.³⁵

The commercial contacts of the monasteries in those regions are further attested, to some degree, by the circulation of late Byzantine glazed pottery. The lack of excavations on Lemnos and the dearth of studies and publications on pottery from salvage excavation on the island prevent a complete analysis of imported pottery and the distribution of locally made pottery. However, during my field survey I recorded decorated pottery from Thessalonike, the Aegean, and Constantinople in the majority of sites that have been interpreted as late Byzantine monastic estates. Furthermore, pottery produced at Lemnos has been found on Thasos, Andros, and possibly Rhodes.³⁶ I would argue that Lemnian pottery found its way to Thasos also through the transportation of goods by the monasteries since some Athonite monasteries, such as Lavra and Pantokrator, had metochia and other possessions on both islands.³⁷

Location and Spatial Organization of Monastic Properties

The archives mention more than twenty metochia scattered around the island of Lemnos during the late Byzantine period. During the four seasons of field survey I completed on the island, I identified and recorded the exact location of eleven of them, while the approximate location of almost all metochia mentioned in the monastic acts are known. While the archives also refer

32 On the environmental conditions, see B. Geyer, "Esquisse pour une histoire des paysages depuis l'an Mil," in *Paysages de Macédoine: Leurs caractères, leur évolution à travers les documents et les documents et les récits des voyageurs*, ed. P. Bellier et al., *TM*, Monographies 3 (Paris, 1986), 99–116; idem, "Physical Factors in the Evolution of the Landscape and Land Use," in *EHB* 1:31–45; I. G. Telelis, "Historical-Climatological Information from the Time of the Byzantine Empire (4th–15th Centuries AD)," *History of Meteorology* 2 (2005): 41–50; idem, "Climatic Fluctuation in the Eastern Mediterranean and Middle East AD 300–1500 from Byzantine Documentary and Proxy Physical Paleoclimatic Evidence—a Comparison," *JÖB* 58 (2008): 167–207.

33 An οἰνοπωλεῖον: *Lavra*, 3: appendix xviii (1415), 219. For more information on monasteries as vendors, see Smyrlis, "Management," 256; idem, *Grands monastères byzantins*, 118, 218–19, 225; Živojinović, "Trade," 106, 114 (all n. 2 above).

34 *Lavra*, 2: no. 77 (1284?), 35; *Vatopedi* (n. 23 above), 2: no. 109 (1356), 263–65; Nystazopoulou-Pelekidou, "Couvents" (n. 2

above), 111–18, 130; Smyrlis, "Management," 254–55; idem, *Grands monastères byzantins*, 106–16; for imperial policies toward the monastic involvement in trade during the fourteenth century, see also Laiou, "Vatopedi" (n. 2 above), 55–60; J. Bencheva, "Naval Trade of Mt. Athos Monasteries in the Middle Ages," *Études Balkaniques* 1–2 (1999): 49–51.

35 Trading privileges and tax exemptions to the monasteries extended to the transportation of goods, the docking of ships, and the buying and selling of goods: Laiou, "Vatopedi," 58; Živojinović, "Trade," 104–7, 115.

36 Pennas, "Φρούριο Κότζιος" (n. 15 above), 68–74. For Lemnian pottery found elsewhere see François, *Céramique Byzantine à Thasos* (n. 15 above); D. Papanikola-Bakirtzi, ed., *Byzantine Glazed Ceramics: The Art of Sgraffito* (Athens, 1999), 92; Dori et al., *Kάτω Κάστρο* (n. 15 above), 126–27, 134–35.

37 *Lavra* (n. 12 above), 3: no. 137 (1357), 29–33; *Pantokrator* (n. 27 above), no. 10 (1384), 95–102.

TABLE I. Monastic estates on Lemnos

Site No.	Site Name	Geographical coordinates ^a	Nearest modern town	Use of site
10	Ag. Ioannis	353416 4414310	Moudros	metochion?
21	Ag. Georgios	349537 4424499	Atziki	metochion
26	Truge	350963 4426747	Perpouli	metochion
31	Zervada	343899 4422964	Syverdia	monydrio?
35	Gomatou	341281 4426689	Sardes, Katalakos	metochion
39	Episkepe	347455 4420950	Karpasi, Livadochori	metochion
44	Ano Chorion	345473 4417533	Agkariones	metochion
47	Archistratigos ton Ano Dunameon	341317 4416569	Pteri, Ag. Dimitrios	metochion
54	Ag. Georgios	336655 4419939	Kaspakas	metochion
58	Gennisi Christou	341833 4414397	Kontias	metochion
65	Theotokos Kakaviotissa	338042 4414499	Myrina	metochion
100	Ag. Prokopios	365472 4427386	Panaya	monydrio?
102	Panaya II	363513 4424160	Aliki	monydrio?
103	Ag. Dimitrios	361503 4425330	Panaya	unknown ^c
107	Chloe	358723 4426929	Kaveiria	metochion
108	Ag. Pachomios	355218 4422556	Repanidi	unknown ^d
109	Ag. Athanasios	355431 4421910	Repanidi	unknown ^d
110	Ag. Dimitrios II	355978 4423233	Repanidi	unknown ^d
111	Ag. Konstantinos and Ag. Eleni	358671 4422190	Aliki, Kontopouli	unknown ^d
113	Ag. Ermolaos	358564 4417199	Kalliopi	unknown ^d

a UTM, lat. band 35S.

b From 1 to 4, 1 indicating least dense or visible.

c Only ruins of what may be a church survive.

d Only ruins of a church survive.

to at least eight monydria, I managed to identify only three sites as possible monydria, since some of those small sites could easily have been destroyed and a few were incorporated in larger estates in a later period. Further, a number of small churches that were recorded on the east side of the island with early and middle Byzantine marble architectural fragments and late Byzantine pottery around them could be the remains of late Byzantine monydria (figs. 9, 10). All securely

located and potential monastic estates are listed on the accompanying table.

Considering the monastic economic interests and activities I have presented, I expected that locational preference of monastic estates and their properties and the monasteries' ability to expand their control over larger areas and increase their property would be affected by the following main factors: the quality of lands and importance of natural resources in the area,

Est. size (in ha)	Visibility ^b	Art. density ^b	Surface finds				Other
			Pottery	Tile	Architecture	Glass	
0.03	3	4	•		•		
	4	4	•	•	•		
0.15	3	3	•	•	•	•	
0.24	3	4	•				
0.70	3	2	•	•	•	•	
0.35	2	3	•	•	•		marble
	3	4	•	•	•		
0.24	2	3	•	•	•		
0.12	4	4	•		•		
0.60	2	4	•		•		
					•		
0.06	2	1	•	•	•		
0.06	2	1	•		•		marble
	1	1	•		•		marble
1.20	1	2	•	•	•	•	marble
0.08	3	1	•	•	•		marble
0.12	1	1	•	•	•		marble
	2	2	•	•	•		marble
	1	1	•	•	•		
	1	1	•	•	•		marble

proximity to trade routes, the presence of other monasteries competing for the same resources, and the power of individual monasteries.³⁸ Here I consider monastic power based on the quantity and quality of lands and other properties already owned on the island, the num-

ber of monastic estates per monastery on the island, and the time they had been present on the island. For a better understanding of the impact of such factors on the monastic decision-making processes, I combined the documentary evidence with the results of my field work and GIS applications.

The distribution map of the monastic estates based on my field survey shows that ten metochia were located on the coast or on coastal plains, mostly on

38 The capacity of some monastic lands for substantial cereal production is further attested in the early Ottoman defters; see Lowry, *Ottoman Realities*, 92.



FIG. 9. Altar in the church of Ag. Athanasios, Lemnos, that incorporates middle Byzantine marble fragments



FIG. 10. Middle Byzantine marble relief embedded in the east wall of the church of Ag. Athanasios

the north side of the island and around Moudros Bay; another six are found in plains, and two are on hills (fig. 3). Haldon has argued in his study on Lemnos that the lands owned by monasteries were of various qualities, ranging from top-quality lands to lands with rocky or poor soils. However, the high concentration of monastic estates in areas of rich soils and arable lands, especially in the north and central part of the island and in the plains around Kontias and Moudros, underline the interest of the monasteries in areas with good-quality lands. All monastic estates were in close proximity to streams or rivers, as shown on the distribution map of sites (figs. 2, 11). Monasteries and peasants also used wells for fresh water since the water table of Lemnos lies close to the ground surface.³⁹ Location was also determined by proximity and easy access to sea routes and main roads, to facilitate transportation of goods in and outside the island quickly and efficiently. The location of many monastic estates in coastal locations and close to ports, for example Vatopedi's metochion

in Moudros and Pantokrator's at Ano Chorion, highlights the importance of proximity to sea routes and easy access to the island from the sea (nos. 10 and 44 in fig. 3). Some monasteries even owned their own ports; for example, Lavra had ports around Gomatou and Kontias.⁴⁰ In the case of Lavra, production could be brought back to its main metochia and shipped to markets from Lavra's own ports or be sent and stored in facilities that it owned in the main ports of Kotzinos and Myrina (fig. 3).⁴¹ Owning ports as well as storage facilities in the busiest ports of the islands and in other coastal locations reflects Lavra's efforts to distribute its goods quickly and efficiently by maintaining the right type and number of properties in appropriate and multiple locations.⁴²

Although more work is needed in tracing the main routes on the island in the late Byzantine period,

40 *Lavra*, 2: no. 99 (1304), 144–51; 3: no. 127 (1346), 33–35.

41 *Lavra*, 2: no. 74 (1284), 22–27; no. 99 (1304), 144–51.

42 Živojinović, "Trade," 104; for Kotzinos, see also Pennas, "Φρούριο Κότζινος" (n. 15 above), 68–74.

39 Naval Intelligence Division, *Geographical Handbook*, 385.

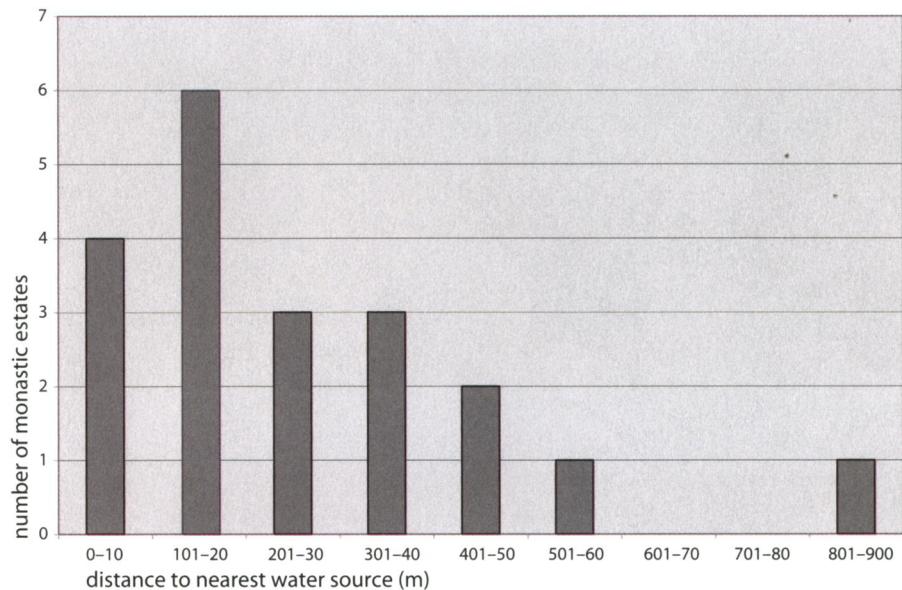


FIG. 11.

Chart of distances of Late Byzantine monastic estates to the nearest water source. Based on topographic map at 1:50000 by the Hellenic Military Geographical Service; topographic map at 1:50000 Roads edition; and Haldon, "Limnos," map 2.

information from the archives suggests that some monastic estates were in proximity to the main roads connecting the island.⁴³ Further, there are examples of road networks connecting monastic estates and properties of the same monastery in adjacent areas, such as the roads from Kourouni to Kontovraki, from Kontovraki to Zervada and to Gomatou, providing communication among Lavra's properties in the northwest part of the island (area between nos. 31, 35, and 21 in fig. 3).⁴⁴ In examining how the presence of one monastery could affect the decisions of other monasteries regarding the type and location of their properties in the same area, I used an allocation model in GIS that can assign entities or edges to features, in this case the monastic estates, until the feature's capacity or limit of impedance is reached. In this model the focus was on the monasteries and their properties, but other sites, such as settlements and fortifications, and their spatial relations to resources and to monastic estates have also been taken into consideration (fig. 12). The allocation model divided the island's surface in areas that each

monastic estate could potentially control based on the actual location of the monastic estates, their numbers, and distance from neighboring estates. It also displayed non-monastic sites that fell inside the areas of monastic control. For comparison, I added to the allocation map information from the monastic archives and from maps created by the editors of the monastic acts of Lavra, Vatopedi, and Pantokrator based on the descriptions and boundaries of areas belonging to specific monastic estates and examined differences and similarities.⁴⁵ Comparison of the areas of monastic control according to the allocation map and the maps of the archives could highlight additional factors that influenced the decisions and the extent and location of property owned by different monasteries. In the example of Lavra's metochion of Gomatou and its surrounding area, the allocation model has separated a large area where Gomatou's properties were located according to the monastic archives, in four subareas (A–D on fig. 13). It assigns only area A to the monastic estate of Gomatou (indicated by a cross) and recognizes other centers/potential estates for areas B, C, and D (indicated by crosses). So in theory the presence of

43 *Pantokrator*, no. 20 (1394), 140–41; *Vatopedi* (n. 23 above), 2: no. 98 (1348), 221, no. 128 (1368), 338. I am currently working on a more systematic study of Lemnos's road system in the Late Byzantine period combining the monastic archives' information with GIS Distance Analysis (cost-distance functions). The results of this study will soon appear in an article.

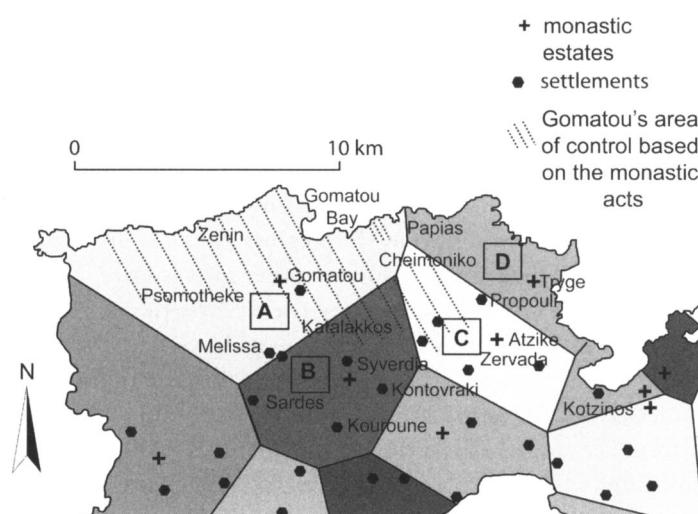
44 *Iviron* (n. 12 above), 4: no. 99 (1430–38), 165–69.

45 *Lavra*, 4:139, carte 10; *Vatopedi*, 2:40; *Pantokrator*, 40–42. These maps mark the boundaries of the main areas controlled by each monastic estate and also note areas where each monastic estate had additional properties.



FIG. 12. Allocation map of the monastic estates, Lemnos

FIG. 13. Allocation map overlaid on the map based on the monastic archives, detail showing Gomatou's metochia and the areas of its potential control. Based on *Lavra*, 4:139, carte 10.



the estates in subareas B–D limit Gomatou's potential to expand its control and add those areas in its properties. However, according to the archives, areas B and D were in fact under Lavra's control and it had established there other metochia and monyndria and owned lands, vineyards, and mills (crosses indicate only the estates that I located during my field survey). Area C is not

controlled by Lavra; it is dominated by the extensive properties and the main metochion of Dionysiou.⁴⁶

Studying further the areas under Lavra's control I considered first the possible changes in the results of the allocation map if I had identified more metochia in that area. According to the monastic archives the majority of metochia in the area belonged to Lavra. The

46 Dionysiou (n. 27 above), no. 21 (1425), 122–24; no. 25 (1430), 135.

only exception is the small independent monastery of Ag. Kyrikos, located south of Gomatou.⁴⁷ Thus, Lavra, with its extended properties and numerous metochia, exercised control in areas A, B, and D. The ability of Lavra to own such an extended area with fertile plains, streams, and proximity to a port should be associated both with the importance of the Athonite monastery and with the fact that Lavra was one of the first monasteries to own any property on the island. In area C the extended properties and main metochion of Dionysiou prohibited Lavra from establishing a metochion in the same area but did not stop it from owning lands there.

The second example is the metochion of Pantokrator at Ano Chorion. Compared to the metochion of Gomatou, it had a smaller fortune on the island and controlled a smaller area (area P on fig. 14). Pantokrator's possessions were close to the metochion and most of them fell into the catchment area of its control. From the allocation map it can be seen that Pantokrator's area of control is limited by other metochia and their properties to the north, west, and south. The majority of these properties belonged to Lavra and Patmos, monasteries that had established their presence on the island long before Pantokrator established its estate at Ano Chorion.⁴⁸ In this case the allocation map shows clearly how the presence of other estates can restrict the control of a monastery in a small area. However, the model failed to recognize Pantokrator's properties (grazing lands and numerous sheepfolds) and control over areas in the Phakos peninsula.⁴⁹ The absence of any monastic estates at Phakos led the allocation model to allocate this area to the metochion of Lavra in Kontias (the nearest metochion), which also had lands at Phakos.

The example of Vatopedi's metochion, Ag. Ioannis (near Moudros), shows a big discrepancy between the two types of maps since the allocation model suggests that the monastery controlled a far larger area than the one described in the archives. The allocation model shows that Vatopedi could have controlled the entire southeastern part of the island (area V on fig. 15), including a number of settlements and important

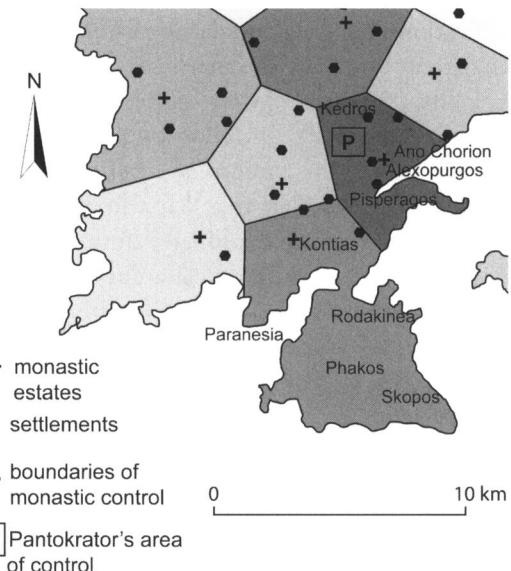


FIG. 14. Allocation map overlaid on the map based on the monastic archives, detail showing Pantokrator's metochion at Ano Chorion and the areas of its potential control. Based on *Pantokrator*, 40–42.

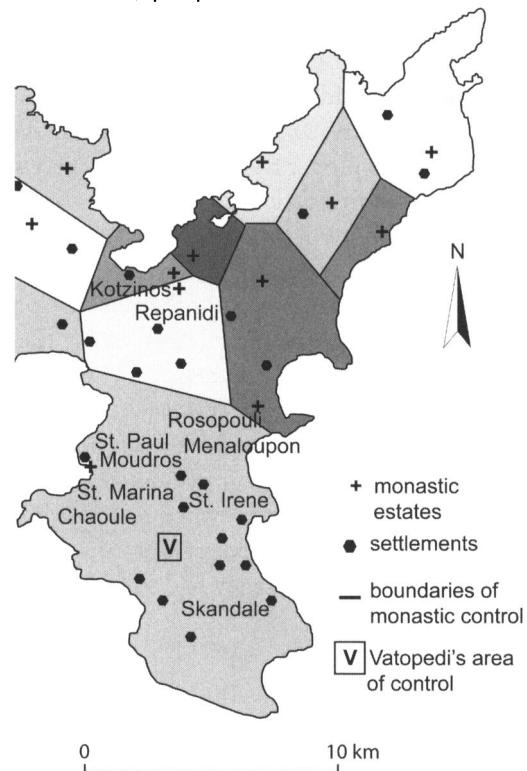


FIG. 15. Allocation map overlaid on the map based on the monastic archives, detail showing Vatopedi's metochion at Moudros and the areas of its potential control. Based on *Vatopedi*, 2:40.

47 The consistent complaints of the monastery of Ag. Kyrikos about the expansion of Gomatou's properties brought changes to the location of Gomatou's additional new lands. *Lavra*, 4:135–36.

48 Pantokrator monastery received its first properties on the island at the end of the fourteenth century. *Pantokrator*, no 12 (1388), 109.

49 See above. *Pantokrator*, 41.

fortifications, but the textual evidence contradicts this scenario, noting that the metochion's main properties, lands, and paroikoi were limited to Moudros and its environs (fig. 15).⁵⁰ The allocation model displays a large area due to the absence of other main monastic estates identified in that area.⁵¹ It also does not recognize other factors that could have limited the area of Vatopedi's control, such as availability of exploitable resources in those areas, defensibility of the area, and the time when Vatopedi started owning properties on the island.

The southeastern part of Lemnos had a concentration of settlements that, according to the archaeological finds and especially pottery, were inhabited in the fourteenth and fifteenth centuries. Thus, it is reasonable to assume that when the metochion of Vatopedi was established in the mid-fourteenth century, it had to share its catchment area with pre-existing settlements and landowners using the same resources in the area. The area southwest of Moudros could not have interested Vatopedi because it has rocky and thin soils not suitable for cultivation. There were also no fortifications on that part of the island, leaving properties and lands exposed to attacks from the sea. In contrast, the area around Moudros is full of fertile lands; Moudros proper had a natural and very safe port, protected by fortifications.⁵²

The allocation model was successful in showing that the presence of one monastic estate could be a limiting factor for establishing another estate owned by a different monastery in the same area. The results of the allocation also suggest that the time when each monastery established its estate on the island was also important, since the newcomers would have to choose between smaller areas limited by other monastic estates in very fertile and crowded areas, as in the case of Pantokrator, or target larger areas that had no monasteries present, even if they had subprime lands

or other limiting factors, as in the case of Vatopedi. The model failed, however, to recognize that the presence of a monastic estate was not a limiting factor in owning lands in the same area. It also could not recognize additional factors such as soil quality and proximity to fortifications that perhaps a more refined version of the same model or the combination of additional GIS applications could take into consideration. Comparisons of the allocation map and the boundary maps based on the archives show slightly different results but also reflect different approaches to issues of control and ownership. Their combined use allowed me to consider that it was possible that the monasteries looked into different factors and made different decisions, depending on the type of property. For example, the presence of another monastic estate was a limiting factor for establishing a metochion but not for owning lands or mills.

Having shown that the presence of one monastic estate could limit the control of another monastery, I also considered additional ways the monasteries established or expanded their control. The coexistence of a number of monastic estates and other landowners in the same landscape and their mutual interest in the exploitation of the same resources created a need for the monasteries to demonstrate their presence and dominance in specific areas on the island and to safeguard their possessions. Control and dominance were also established by towers or even entire fortifications, used as a base of monastic and economic activities, as a place for safe storage, and as a focal point for the control of monastic possessions. As I discuss below, several monasteries owned forts and towers around the island. Here I examine the role specifically of freestanding towers owned by monasteries and their importance in exercising control over monastic properties. Such towers could be used as a refuge for monks and inhabitants of the area, but their proximity to stronger and larger fortifications does not make them ideal places of refuge. For example, in the allocation model of the monastic estate of Pantokrator in Ano Chorion, the area of its control was limited by the presence of other monasteries. The tower (Alexopyrgos) of Pantokrator in that area could not have served any military purpose and could have not been a vital element of the fortification network of the island. (The tower of Alexopyrgos is no longer standing, but its exact position is known from documents and photographs from the beginning of the 20th century, when it was still visible.) Moudros

50 *Vatopedi*, 2: 39–43.

51 In the second half of the fourteenth century the monastery of Kutlumus owned a small monydrion, a mill, and land at Skala. But Kutlumus could not successfully limit the economic interests of Vatopedi in case it wanted to expand its control. For the fortune of Kutlumus, see P. Lemerle, ed., *Actes de Kutlumus* (Paris, 1988), no. 24 (1362), 97–98.

52 Naval Intelligence Division, *Geographical Handbook* (n. 3 above), 383–85; Th. G. Belitsos, “Το κάστρο του Μούδρου: Περιήγηση στο χώρο και τον χρόνο,” *Λημνιακά Μελετήματα* (1999): 1–7.

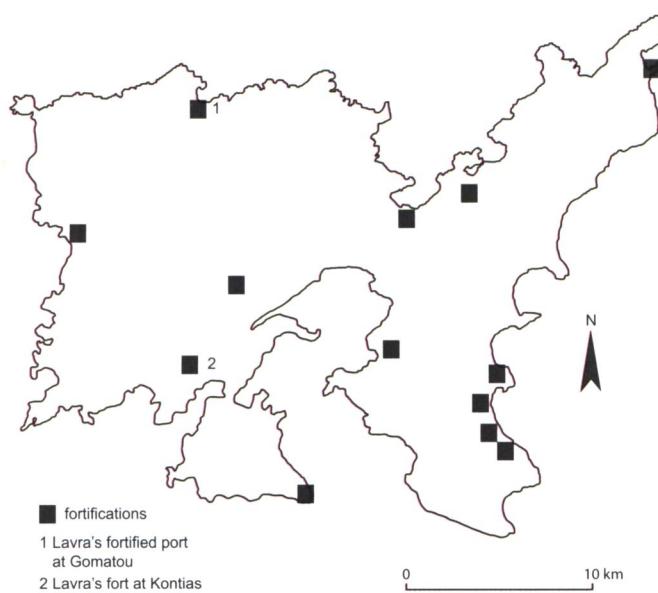


FIG. 16. Distribution map of recorded late Byzantine fortifications

Bay was already guarded by two forts in Kontias and Moudros (fig. 16). The need for a tower in the area to strengthen even more the fortification network and perhaps to facilitate exchange of messages (through fire) and information between neighboring fortifications was met with the later building of the tower of Pisperagos, an indication that Pantokrator's earlier tower (Alexopyrgos) was not already playing that role.⁵³ The towers of Kontovraki owned by the monastery of Iviron, in Moudros owned by Vatopedi, and in Skala owned by Kutlumus are all in close proximity to stronger fortifications, so their primary purpose cannot have been to act as defensive structures or as refuge places.⁵⁴ All their towers were in areas where other monasteries had possessions, so the towers functioned as control points, controlling and safeguarding the monastic lands against trespassing, against theft of produce and false claims on ownership of the same area by other landholders. Additional uses of those towers included storage of agricultural equipment and

53 *Pantokrator*, no. 20 (1394), 140–45.

54 M. Goudas, "Βυζαντιακά έγγραφα της εν Αθω ιεράς Μονής Βατοπέδιου," *EEBS* 4 (1927): 247; *Vatopedi*, 2: no. 114 (1359), 283; *Kutlumus*, no. 24 (1362), 97–98; *Iviron*, 4: no. 99 (1430–38), 168; *Pantokrator*, 39.

agricultural goods until these products were transported to the monastic estates or to markets.⁵⁵ The presence of numerous monasteries and their possessions on the same island made these towers an expression of power, ownership, and control.⁵⁶

The Impact of Monastic Activities on the Rural Landscape

The Natural Landscape

In the last two Byzantine centuries the monasteries' various economic and building activities impacted the natural and social environment. Monasteries contributed to the amelioration of lands by investing money and time to make rocky or second-quality lands arable, especially in the thirteenth century.⁵⁷ The monasteries dealt with depopulation, land abandonment, desertification, and decreasing population by occupying abandoned areas and cultivating them.⁵⁸ At the end of the fourteenth century and the beginning of the fifteenth century, when grain prices had risen significantly and depopulation was affecting the production of goods on the island,

55 Smyrlis, "Management," 254–55; idem, *Grands monastères byzantins*, 219 (both n. 2 above). For similar functions of towers in other regions see, J. Lefort, "Habitats fortifiés en Macédoine orientale au Moyen Age," in *Habitats fortifiés et organisation de l'espace en Méditerranée médiévale* (Lyon, 1983), 64; C. Giros, "Remarques sur l'architecture monastique en Macédoine orientale," *BCH* 116 (1992): 419–20; D. Kyritses and K. Smyrlis, "Les villages du littoral Égéen de l'Asie Mineure au Moyen Age," in *Les villages dans l'empire byzantin IVe–XVe siècle*, ed. J. Lefort, C. Morrisson, and J. P. Sodini, *Réalités Byzantines* 11 (Paris, 2005), 441; P. Lock, "The Medieval Towers of Greece: A Problem in Chronology and Function," in *Latins and Greeks in the Eastern Mediterranean after 1204*, ed. B. Ardell et al. (London, 1989) 137–39.

56 Some monastic acts mention that a donation of a tower by military officials had a military purpose, such as the safeguarding of the area and especially the protection of monastic properties. However, such a donation was also part of the donor's plea for their soul's salvation. In that respect the donation of a tower does not differ in its aims from that of an artifact, a church, or any other building. Perhaps the donation of a tower rather than another building was more common or appropriate for military officials due to their profession. *Vatopedi*, 2: no. 114 (1359), 283; *Lavra*, 3: no. 141 (1362), 85; *Kutlumus*, no. 24 (1362), 97–98; *Pantokrator*, no. 20 (1394), 140; *Iviron*, 4: no. 99 (1430–38), 165.

57 Laiou, "Agrarian Economy" (n. 1 above), 352–53.

58 For soil erosion and desertification, see J. R. McNeill, *The Mountains of the Mediterranean World: An Environmental History* (Cambridge, 1992), 6–7; Geyer, "Physical Factors" (n. 32 above), 43.



FIG. 17. Early modern windmills at Kontias, Lemnos

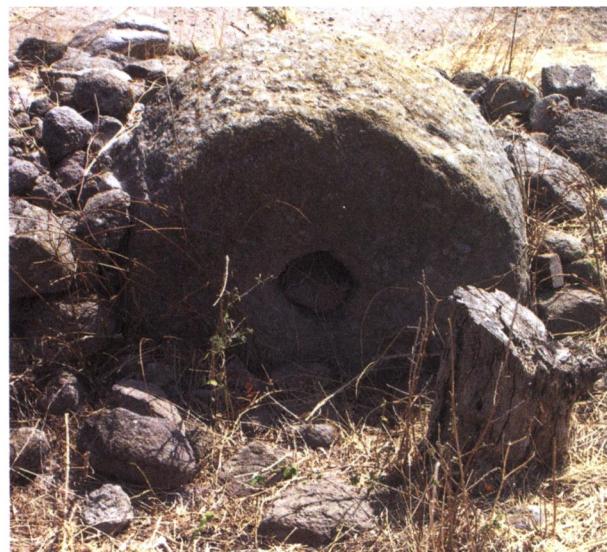


FIG. 18. Millstone at Kouroune, Lemnos

some monasteries gave monastic lands to their paroikoi so more land could be cultivated and production could be increased.⁵⁹ The different economic activities also had different consequences on the Lemnian landscape. For example, intense agricultural production by the monasteries in the thirteenth and early fourteenth century led to soil exhaustion in certain overexploited areas. In the fifteenth century the lack of sufficient manpower to cultivate the lands and the coinciding investments in pastoralism meant less overexploitation of cultivated lands but some stress in grazing areas.

The Built Environment

Monastic economic activities also brought significant changes to the built environment of the island, initially with the monastic estates themselves and a number of churches scattered around Lemnos. Later on, the monasteries were responsible for building, maintaining, and restoring a number of other structures, such as storage spaces, mills, threshing floors, sheepfolds, and towers.

Several metochia owned mills around the island. Most were windmills, for the strong winds on the island. But in areas rich in streams, such as around Gomatou, most were water mills.⁶⁰ These water mills

must have been used only seasonally, since the streams dried up in the summer, confirmed by the seasonal taxation of the mills in the early Ottoman era.⁶¹ Today the majority of surviving mills were built during the nineteenth century, but many are found in the same general areas as their Byzantine predecessors (figs. 17, 18).⁶²

Another structure closely related to cereal production is the threshing floor (alonotopion).⁶³ Many have been found on the island, although their date of construction cannot be determined (fig. 19).⁶⁴ During the field survey two such structures were recorded because they were surrounded by late Byzantine pottery inside and outside the main stone circle, suggesting

(n. 44 above), no. 24 (1362), 98. We also have cases of paroikoi entering into partnerships and owning parts of mills; see for example *Lavra*, 2: no. 73 (1284), 19–21 and no. 99 (1304), 144–47. Watermills close to Gomatou: *Lavra* 4: tab. 173b.

61 Lowry, *Ottoman Realities* (n. 3 above), 118.

62 For watermills and windmills, their locations and distribution, see also M. Given, "Agriculture, Settlement and Landscape in Ottoman Cyprus," *Levant* 32 (2000): 215–36; N. Zekos, *Πλαπίκιον Όρος: Αρχαιολογικός Οδηγός* (Kavala, 2001) 86–88; K. Kourelis, "Monuments of Rural Archaeology: Medieval Settlements in the Northwestern Peloponnese" (PhD diss., University of Pennsylvania, 2003), 192–93.

63 *Πάτμου* (n. 16, above), 2: no. 74 (1285), 219–20; *Vatopedi* (n. 23 above), 2: no. 98 (1348), 220; *Pantokrator* (n. 27 above), 190.

64 N. Sifounakis, *Μία άγνωστη αρχιτεκτονική: Οι μάντρες στη Λήμνο και στα άλλα νησιά των Βορειοανατολικού Αιγαίου*, 2nd ed. (Athens, 1993), 155.

59 *Pantokrator*, "Faux" (end of 14th c.–beginning of 15th c.), 189–93; *Dionysiou* (n. 27 above), no. 21 (1425), 122–24; Laiou, "Agrarian Economy," 366.

60 *Lavra*, 2: no. 99 (1304), 144–51; 3: no. 139 (1361), 81; *Kutlumus*



FIG. 19. Threshing floor at the metochion of Gomatou, Lemnos

late Byzantine activity on the sites. Depending on social organization and patterns of ownership, threshing floors were located either in the fields or in the villages. They could be owned by entire communities or by individual families, as was the case of Ottoman and early modern villages in Cyprus.⁶⁵ In the case of Lemnos, monastic threshing floors were often close to the metochia, according to the archives' descriptions and confirmed by early modern examples. Peasants also located their threshing floors closer to their houses than to their fields, attested in Pantokrator's archives and evident in early modern examples, such as the threshing floors at the abandoned settlement of Vounochoria.⁶⁶ The location of mills and threshing floors closer to metochia and to monastic storage facilities in ports than to the production sites

suggests that much of the processing and the preparation of a surplus happened in the metochion and that those metochia had firm control over their production.⁶⁷

No archaeological remains associated with wine production, e.g., wine presses or vats, were identified. It is likely that vats and storing containers were standing features that were later demolished and not carved on natural bedrock, such as those found on Crete and in areas around the Peloponnese.⁶⁸

67 *Lavra*, 3: no. 139 (1361), 81; *Dionysiou*, no. 25 (1430), 135; *Kutlumus*, no. 24 (1362), 97–98.

68 Hellenic Ministry of Culture, *Settlements of Mani* (Athens, 2004), 116; G. Katsales and M. Mare, “Τα κτιστά μεσαιωνικά πατητήρια της Κεντρικής Κρήτης,” in *Οίνος Παλαιός Ηδύποτος: Το κρητικό χραστικό από τα προϊστορικά ως τα νεώτερα χρόνια*, ed. A. Mylopotamitake (Heracleio, 2002), 161–68; G. Moschou and K. Giapitzoglou, “Λαξευτά πατητήρια: Τοπογραφική και τυπολογική προσέγγιση,” *ibid.*, 169–87.

65 Given, “Ottoman Cyprus,” 223–24.

66 *Pantokrator*, “Faux” (end of 14th c.–beginning of 15th c.), 189–93.



FIG. 20.
Pithos found in situ at the metochion of Gomatou

The involvement of monasteries with pastoralism produced a number of enclosures and sheepfolds (mantres), where animals were kept and economic activities such as shearing and milking took place. Such structures were located adjacent to the monastic estates or on the grazing lands that the monasteries possessed around the island.⁶⁹ Many sheepfolds were concentrated on the northern part of the Phakos peninsula, which was used by monasteries exclusively for grazing.⁷⁰ A recent study of sheepfolds' architecture and function on early modern Lemnos has explored the evolution of structures that started as buildings for the safekeeping of animals and developed into more complex structures with additional functions (habitation, storage, the processing of agricultural produce), depending on the needs of the owner.⁷¹ Similar structures also existed in late Byzantine Lemnos, probably belonging to the original type with areas only for the animals and their food.

Monasteries also built a number of storage structures, either within the monastic estates or in other locations. I distinguish three main categories of storage.

The first two categories are storage vessels and storage rooms found in the metochia. These are meant for storing mainly goods for self-consumption.⁷² In the area of Gomatou such storage vessels can still be found in situ, as parts of the early modern structures of the metochion (fig. 20). Although the buildings are post-Byzantine, analogies can be drawn between spatial arrangements and organization of storage facilities in the Byzantine and post-Byzantine periods.⁷³ Storage rooms could also be found in basements, especially of kitchens and refectories. The third category covers storage facilities intended for storing the surplus that would be distributed to markets. Such storage spaces could be found either close to the metochion as part of the main complex or in buildings found in castles and ports, especially ones that functioned as large market areas, such as Kotzinos.⁷⁴ The lack of systematic excavations in the Byzantine castles and ports of Lemnos makes it impossible to assign functions to any of the architectural remains still visible, so storing facilities inside the fortified areas cannot be identified. In the castle of Kotzinos the excavators have interpreted a small area as a storage room that could be

69 *Dionysiou*, no. 25 (1430), 135; *Lavra*, 3: no. 139 (1361), 74; *Pantokrator*, 41–42.

70 *Pantokrator*, no. 20 (1394), 140–45; *Lavra*, 3: no. 141 (1362), 85; Koder, *Aigaion Pelagos* (n. 3 above), 259–60.

71 Sifounakis, *Mάντρες στη Αήμαντο*, 35–37.

72 A. Orlando, *Μοναστηριακή Αρχιτεκτονική* (Athens, 1927), 72–75.

73 Koder, *Aigaion Pelagos*, 169–70.

74 *Lavra*, 2: no. 99 (1304), 144–51; *Dionysiou*, no. 16 (1430), 86; no. 25 (1430), 135; *Kutlumus*, no. 24 (1362), 97–98.

the only known example of a Byzantine storeroom in a castle on the island.⁷⁵

Lemnos in the late Byzantine period had a strong fortification network, which included fortified towns such as Myrina, Kotzinos, and Skala; forts such as the one in Moudros; and a number of towers and vigles (here meaning either watchtowers or simply elevated areas with a good overview of the surrounding landscape) such as the one on the Phakos peninsula (fig. 16).⁷⁶ Monasteries participated actively in the strengthening of that fortification network and were involved in the building, maintenance, and restoration of towers and forts. A number of monasteries contributed to the maintenance and restoration of fortifications owned by the state by providing building materials and labor.⁷⁷ Monasteries also owned towers or fortifications that were built by the state on the condition that the monasteries would maintain them and restore them as needed.⁷⁸ Lavra is unique in owning two coastal forts in Gomatou and Kontias in close proximity to its two main estates and freestanding towers (fig. 16).⁷⁹ Regarding the monastic towers, as I have mentioned previously, I distinguish between those serving exclusively monastic interests, such as the towers in Kontovraki and Ano Chorion, and those participating more actively in the fortification network of the island and used also for the protection of specific areas and their population, such as the tower at Pisperagos.⁸⁰

The Social Landscape

The monasteries had a great impact on the social landscape. Scholars have often considered the monasteries to have been a negative element in the rural landscape, suggesting that their economic activities pressured peasants to sell their lands and burdened them with heavy taxes. The monasteries on the other hand enjoyed tax exemptions and privileges that deprived the state of valuable revenues.⁸¹ However, the economic interests of the monasteries led also to actions that benefited the entire rural community on the island. The monasteries' participation in maintaining already existing fortifications and the building of new ones had significant consequences for the safety and stability of life on the island. That safety further influenced some inhabitants not to abandon their settlements and flee the island. Monasteries were also responsible for repopulating abandoned areas and encouraging peasants to settle there. Peasants could also benefit from some of the monasteries' resources, such as animals, tools, mills, and lands, by renting them for their own use. Furthermore, owing to the lack of manpower and the decrease in production at the end of the fourteenth and beginning of the fifteenth centuries, monasteries gave additional lands to their paroikoi in order to encourage them to remain on the island and cultivate the lands.⁸² This improved the personal wealth and quality of life of those paroikoi who found themselves with much more property than did the previous generations or of the paroikoi of other regions, such as Macedonia.⁸³ Without the monasteries strengthening fortifications and counteracting depopulation and decrease of production, the political, economic, and demographic conditions of the island would have deteriorated far more dramatically than they did in the late Byzantine period.

75 Pennas, "Φρούριο Κότζινος" (n. 15 above), 72–73; Koder, *Aigaion Pelagos*, 302.

76 *Lavra*, 3: no. 141 (1362), 85–88; On the fortification network, see Kontellis, *Κάστρα της Αήγαος*, 134, 173–74; Kondyli, *Rural Sites* (n. 6 above), 195–205; for the operation of vigles, see Lowry, *Early Ottoman State* (n. 3 above), 98–99; idem, "The Role of Byzantine Provincial Officials following the Ottoman Conquest of Their Lands," in *Proceedings of the 3rd Congress on the Social and Economic History of Turkey*, ed. idem and R. Hattox (Istanbul, 1990), 263–4; idem, *Ottoman Realities* (n. 3 above), 35–37; Frangellis, *Αήγαος η φιλτάτη* (n. 3 above), 250.

77 *Lavra*, 3: appendix xiv (1361?), 212–13.

78 For example, the tower at Phakos was built by Georgios Synadenos Astras following an imperial order. *Lavra* 3: no. 141 (1362), 85.

79 *Lavra*, 3: no. 127 (1346), 33–35.

80 *Pantokrator*, no. 20 (1394), 140–45.

81 P. Charanis, "The Monastic Properties and the State in the Byzantine Empire," *DOP* 4 (1948): 117; idem, "The Monk in Byzantine Society," *DOP* 25 (1971): 83; G. Ostrogorski, *Quelques problèmes d'histoire de la paysannerie Byzantine* (Brussels, 1956), 37.

82 *Lavra*, 3: no. 139 (1361), 74–82; *Pantokrator*, "Faux" (end of 14th c.–beginning of 15th c.), 189–93; *Dionysiou*, no. 21 (1425), 122–24; Laiou, "Agrarian Economy" (n. 1 above), 366; N. Svoronos, "Sur quelques formes de la vie rurale à Byzance: Petite et grande exploitation," *Annales ESC* 11 (1956): 333.

83 Some of these paroikoi owned more than 100 modioi of land. *Pantokrator*, "Faux" (end of 14th c.–beginning of 15th c.), 189–93; *Dionysiou*, no. 21 (1425), 122–24; N. Oikonomides, ed., *Actes de Docheiariou* (Paris, 1984), no. 60 (first quarter of 15th c.), 307–11.



This study of monastic economic activities and their impact on the landscape reveals the effort and organization that the monasteries put into the pursuit of their economic interests. These interests led to a variety of land uses and exploitation of the Lemnian landscape, including intense cultivation, animal husbandry, and extensive building activities. The impact of the monasteries on the rural landscape was not only multidimensional and versatile but also constantly changing and responding to new needs and new economic and demographic conditions. Such responses included diversifying activities by modifying agricultural practices and shifting resources to alternative economic activities. Their constant attempts to acquire new lands and other properties and to define their spatial relationships to other sites and resources suggest lively and flexible institutions ready to incorporate new possessions and expand their network of operations. Their resilience is also evident in the new roles that monasteries undertook against depopulation and abandonment of the rural landscape by boosting the population, encouraging peasant cultivation, and strengthening the

fortification network of the island. The monasteries' ability to take speedy advantage of tax exemptions and new privileges involving trade, wine selling, and animal husbandry, upon which they then focused, further display their adaptability. The monasteries were not the single variable of stability and change in the Lemnian rural landscape, since peasants, other landowners, and the state all impacted every aspect of the rural landscape. However, the monasteries tried to respond dynamically to economic and demographic pressures and to contribute to the stability of the economic and political life of the island; without their presence, the Lemnian landscape would have experienced further abandonment and would have felt the economic and demographic crisis more intensely than it did.

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